

BAR FEED SYSTEMS HELP REDUCE MANUFACTURING COSTS AT SOUTHERN FABRICATORS



At **Southern Fabricators** in Memphis, Tennessee, the installation of bar feed systems to complement turning operations has helped the company reduce manufacturing costs and improve control of the machining process. Southern Fabricators is a large job shop with some 580,000 square feet of manufacturing floorspace. The company, in business since 1956, fabricates steel components that range in size from a quarter up to 30' or longer for a variety of original equipment products. These include parts for trailers and rail cars, as well as large oil pans for locomotives.

Southern Fabricators employs a wide range of machine tools, some 230 in all, including 30 CNC machine tools, plasma and laser cutters, mechanical presses and programmable press brakes ranging from 45 to 2000 tons. Inside this job shop is a machine shop/toolroom where all of the tooling for the fabrication operation is made.

Justifying Capital Expenditures

To meet increasing demand for components, the company had sub-contracted some 70-80 parts to local machining vendors. But in early 1997, the growing national economy allowed company managers to consider expanding its machining capability.

"We needed to install a new lathe," said Norris Roberts, Southern Fabricators Tool Engineer. "To justify the expenditure, we had to bring those sub-contracted parts back in house." The majority of those parts were machined from round stock, so, along with the first lathe, the company installed the first of what was to be seven bar feed systems from Lexair, Inc., Lexington, Kentucky.

The system Southern Fabricators selected was the economical, heavy duty Rhinobar[®] hydrodynamic bar feed system. The Rhinobar[®] handles 12' stock and is available in tube sizes ranging from 1/4" to 1 3/4" in 1/8" increments and 1 3/4"-2 3/4" in 1/4" increments. It can be customized to handle virtually any size or shape bar stock by simply changing the feed tube size. A choice of three tube sizes are included as standard equipment.



The seven Rhinobar[®] bar feed systems are used in conjunction with Cincinnati Milacron CNC turning centers which include; a Cinturn, two Falcon 400s, two Falcon 200s, and two Hawk 150s. A wide variety of parts dies, spacers, pins, form tooling, dowels, and bushings are produced on the turning centers. Complexity is the watchword. Some parts are bored, some turned, others faced, some have turned contours, while others have angles and steps. Materials range from cold-rolled and hot-rolled stainless steel to, brass and D2 tool steel. Sizes vary from 4" to 18" diameter form tooling to pins that are 0.25" to 3.5" in diameter and 0.5" to 8" long. A typical operation includes turning shafts and drilling a center hole. Then that part is cut to length and the bar feed system advances another increment of stock into the turning center. This operation takes about 45 seconds.

"We've been able to reduce our manufacturing costs by about 50 percent by machining these

parts ourselves," Roberts said. Part of the reason for that is because once the operator loads the bar and starts the operation, he is free for other duties, reducing the need for additional labor. Roberts added that turning output has tripled since the installation of the turning centers and bar feeders. The bar feed system allows the turning centers to run unattended for long periods because it eliminates chucking and rechucking of the workpiece. An end of bar signal and an auto pusher feature retraction allow the Rhinobar[®] system to operate unattended.

Stability In Design

Because the bar feed system provides a high degree of stabilization to the round stock, the quality of the machined parts has improved, according to Roberts, who added that the basic print tolerance at Southern Fabricators is ± 0.0005 ".

In the Rhinobar[®] design, oil fills the gap between the bar stock and feed tube, acting as a noise damping support that provides a high degree of stability. As the bar begins to turn, hydrodynamic forces move it toward the center of the feed tube. Centering forces are increased as bar speed increases.

The system's oil recuperator features a bearing mounted revolving support bushing that also helps stabilize the bar stock, eliminating vibration. This support, working with a dynamic bearing-mounted pusher cone that maintains contact with bar chamfer, allows for much higher turning speeds than other bar feed systems. At Southern Fabricators, application speeds range from 200 rpm to 4,000-5,000 rpm. The front swing out mechanism includes a large barrel clamp to further reduce bar vibration.

"We believe the bar feeders in conjunction with the turning centers have significantly improved our production capabilities," Roberts said. "We have been able to reduce our manufacturing costs for certain parts and exercise more control over the machining process."

Because of its expanded capability, the company is performing more secondary turning operations for customers than before and has added a significant amount of new production work as manufacturers look to do less machining and fabrication and more assembly operations.
